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DIRECTED INTERNSHIP – STRATEGIC ANALYSIS ON URBAN MOBILITY OF AN AFRICAN CAPITAL CITY

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A project carried out on the Management course under the supervision of:
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Abstract

African urban cities are growing very rapidly. By 2050, 1.2 billion people, or 60 percent of all Africans, will live in urban areas.[1] We are witnessing an unprecedented pace of urbanization in Africa and we have seen similar movements in other continents before. This report presents a strategic and broad analysis on the problem of urban mobility in Luanda, capital of Angola. An integrated urban planning solution will be presented as one of the best alternatives in order to solve the problem. Throughout the analysis, the political importance will always be taken into consideration as a key success factor for the successful implementation of an integrated urban plan.

Keywords: African urban cities, integrated urban planning, Luanda, political factor

[1] Interview with Joan Clos, former mayor of Barcelona and UN Habitat's Executive Director in Africa Renewal Online - April 2012

Contents

1. Introduction

This document was elaborated on the basis of a project developed at Greenwich Consulting Portugal with direct supervision of a professional team of experienced management consultants and direct contribution of international experts among Greenwich Consulting Group.

The main objectives and goals were the following:

- Characterization of the city of Luanda and identification of the urban mobility standards of each population segment
- Identification of the main critical zones of urban mobility in the city of Luanda
- Analysis of the urban mobility problem in Luanda and strategic framework according to the different themes that have direct influence on it
- Presentation of alternative scenarios for the resolution of the urban mobility problem
- Recommendation of the implementation of a specific action plan – MobiLuanda

2. Urban Development Models

Metropolitan areas have come under intense pressure to respond to exponential growth of the population in urban areas.[2] Governments had been feeling the pressure to link planning of land use, transportation, and environmental quality, as well as citizen concerns about managing the side effects of growth such as sprawl, congestion, housing affordability, and loss of open space. In the developing world, politicians are facing a rising pressure for the need of adequate policy tools to evaluate urban development strategies.[3] This need, placed within the context of economic booming, unplanned urban growth, sustainable development, and disorganized public administrative regimes, has kindled an interest in the use of integrated urban models that explicitly consider urban transportation and land use interactions. The use of these models has helped governments to better understand urban processes; however, they can only be useful to society as a whole if used to inform correctly the decision-makers about the benefits.[4] These integrated urban models[5] are based on three main pillars: environment, urban economic process and policy management. Firstly, any urban development model should hereafter take into consideration the key importance of environmental sustainability, following on the legislative actions that are taking place in many countries. Secondly, it has been strongly emphasized that an integrated model should not only be a model of travel and land development[6] but a model of urban economic (and demographic) processes as well. These processes involve the dynamics of the labour market as well as those that generate person travel and goods movement within the urban area. Finally, there is a growing expectation for integrated urban models to be

[2] Rakodi, C., 2005
[3] Guy, S. , Henneberry, J. , 2000
[4] World Bank Working Paper Series, 2005
[5] Miller, E.J., Kriger, D. and Hunt, J.D, 2008
[6] Urban Land Markets, 2012

a useful decision support tool for policymaking. Urban models have also been expected to respond to other issues such as poverty, public health, life quality and safety. This failure to develop decision-making tools is due mainly to the lack of institutional mechanisms for land use and transportation integration and the financial constraint to support planning tools development in the face of competing economic and social development priorities.

3. Brief Contextualization of the country

Angola's context stands-out in the African continent. It is a post-conflict democratic country[7] with a vibrant economy which in less than a decade of peace has transformed the country from a low income centrally-planned system to a middle-income market economy. On the other hand, it has a fragile state apparatus where the relationships between politics and economic power sometimes are not very clear,[8] it is struggling with high poverty[9] levels, a deficient network infrastructure that is still being rebuilt and an inefficient public administration. Moreover, the excessive dependency on oil tax revenues leaves the country prone to terms of trade and fiscal shocks[10] which had led to a fiscal crisis in 2009 when the economic crisis curbed oil demand and generate a terms of trade shock. Despite its numerous challenges, Angola is a thriving country with a booming "oiled-economy"[11] and legitimate aspirations to play a prominent role in African continent.

[7] The Economist Intelligence Unit's 2011 democracy index ranks Angola 133rd out of 167 countries
[8] Transparency International, a respected NGO that investigates government fraud, ranks Angola 168th out of 178 countries in its corruption perception index (Daily Mail, August 2012)
[9] Two-thirds of Luanda's five and half million residents live in shanty-town squalor. Sheltering beneath little more than cardboard and planks of wood, families cook over open fires, scavenging through rubbish on the street (Daily Mail, August 2012)
[10] In 2010, oil represented 95 percent of all exports and accounted for 79.5 percent of fiscal revenues. (African Development Bank, 2010).
[11] Nowadays, Angola has a total production of around 1.9 million barrels a day - and it is second only to Nigeria in its exports – and it has an estimated production capacity for 2020 of about 2.6 million barrels per day (Maugeri, 2012)

3.1 Characterization of the city of Luanda

Luanda is undergoing a process of reconstruction of the city and it has a very high population density[12], on a radius of 12km, due to the concentration of points of interest in the city centre which has been causing systematic problems of traffic congestion.[13] In order to better understand the complexity of the urban mobility problem in Luanda, we should analyse the city based on seven axes[14]:

1. *Geography:*[15] capital built around a bay, limited by rivers and with intense precipitation on half of the year;
2. *Demographics:* it has 30% of the national population, has doubled in size in 10 years,[16] about 45% are younger than 14 years; rural exodus, growth of immigration community, high mortality rate and big families (>5 members)[17];
3. *Social:* about 70% of the population lives with less than $2/day,[18] high distance between residences and workplaces, middle class appearance, high levels of criminality, low educational and cultural level;
4. *Environmental:* high CO2 emissions,[19] lack of basic infrastructure for water runoff, slums surrounding the city without hygiene conditions and with high level of sound pollution;
5. *Political:* capital city of the country, 30 years of war conflict, main localization of public administrative services, traffic management done by municipality

[12] Luanda has a projected population of 8,1 million people for 2025 (McKinsey Global Institute, 2012)
[13] Empirical observation and methodological analysis of a Greenwich Consulting team of experts.
[14] Model designed by Greenwich Consulting team – not based on any other urban development models
[15] CIA Factbook, 2011
[16] Think Africa Press, 2011
[17] Greenwich Analysis based on previous projects that require in-depth demographic analysis
[18] INE Angola, 2011
[19] Although Angola ranked 139th out of 214 countries in the global ranking of CO2 emissions (UN Statistics Division, 2012), empirical observation by Greenwich Consulting led to the conclusion that Luanda presents low air quality due to the excess of CO2 emissions

authorities,[20] lack of public investment in public transports and support infrastructures;

6. *Economical:* 2nd most expensive capital in the world,[21] headquarters of national and international economic groups, international logistic hub, main point of national air traffic, occupation of roads and footpaths by informal markets;
7. *Technical:*[22] disorganized construction since last years, difficulties in drainage and sanitary waste, use of police signalmen for traffic management, lack of parking spots.

3.2 Urban mobility characterization

The high concentration of goods and services in downtown Luanda translates into difficult areas of movement, justifying the practice to occur an average of 11 million daily trips within a radius of 18 km from the centre of Luanda.[23] Those daily trips are justified by many reasons andgrouping the inhabitants of Luanda in clusters, it is possible to assess their patterns of urban mobility, and to identify the existence of the following clusters: upper class, middle class, poor, expatriates, tourists and foreign businessmen. Among these clusters it is noteworthy that the population which belongs to the lower class tends to move in order to satisfy basic needs (work, health and daily purchases), while on the other hand, for example, foreign businessman make very constant journeys between hotels, office workplaces and restaurants.

[20] Autoridade de Transporte de Luanda (ATL)
[21] Yahoo Finance, 2012
[22] "O País", 2012 – Interview with Helder Preza
[23] Greenwich Consulting analysis based on previous estimations for other projects done in Luanda

4. Analysis and comprehension of urban mobility

4.1 Urban Mobility - 360º Concept

Fig.1 Urban Mobility - 360º Concept

The problem of urban mobility should be analysed comprehensively, since there are bidirectional impacts in several relevant areas of the city, such as housing, industry, tourism, energy and society, and measures are framed within three different time horizons – short, medium and long term. It is very important to take into consideration that the success or failure of implementation of any measure aimed at any of the areas shown above, is always dependent on the political will. Finally, it is important to consider the importance of sustainability, for it must take into account the impact on future generations.

Although there are several areas that are directly related with the issue of urban mobility, **this study is focused on the theme of transports due to its strategic importance in the country's development**, and thus all problems and solutions presented forward will be evaluated under this issue's light. Moreover, the impact of the transport sector in the problem of urban mobility must be analysed from the perspective of four different categories[24] that are relevant for the daily life of the people living in Luanda, namely: environment,[25] economic efficiency,[26] life quality[27] and security.[28]

4.2 Upcoming challenges from Luanda's urban mobility

After the analysis of the main conclusions drawn from the characterization of the city and the problem of urban mobility in Luanda, it is possible to conclude that there are

[24] Categories created and defined by Greenwich Consulting experts
[25] Criteria: types of pollution (air, water, land, visual and sound)
[26] Criteria: productivity, cost of travel, investment climate, informal economy, economic indirect costs, property damage
[27] Criteria: Cleaning / hygiene, accessibility, convenience, redundancy, travel time
[28] Criteria: physical integrity, road accidents and thefts

five important themes[29] to be addressed, namely: under sizing of the city, road infrastructure, road accidents, pedestrian barriers to mobility, cost of mobility. For each of them there are several problems that arose, and the following problems were identified by the Greenwich Consulting team on the field:

1. *Under sizing of the city:* limited capacity of international transportation of passengers, congestion at peak hours, no mapping of the city, concentration of services and jobs in the city centre, lack of parking alternatives, reduced number of railways, logistics hub in the city centre;
2. *Road infrastructure*: poor water drainage infrastructure, city under constant reconstruction works;
3. *Road accidents*: disregard for the highway code, conservation status of the vehicle fleet, lack of road signalization; natural aggressiveness of people;
4. *Pedestrian barriers to mobility*: occupation of footpaths by informal markets, lack of safe pedestrian paths, low level of security in the city;
5. *Cost of mobility*: corruption by traffic authorities, number of public transports, poor quality of public transport, dependence on imported vehicles;

A full analysis on these problems is available in the appendixes.[30]

5. Scenario analysis

After the definition and evaluation of the problems presented, we come to the evaluation phase of possible scenarios to improve urban mobility in Luanda. The scenarios presented next differ in the degree of disruption on the current situation, the benefits generated as well as the costs and implementation time.

[29] Structure defined by Greenwich Consulting team
[30] See appendix 8.1

5.1 Capital city delocalization – New Luanda

Hypothesis: Relocation of the political and administrative capital of Luanda to another city of the country.

How:

- Planning to build a new city from scratch and built outside the city of Luanda;
- Relocating political and administrative services, transferring the political power out of Luanda;
- Creating tax incentives for the development of new business and industrial zones, on the outskirts of Luanda;
- Developing residential areas adjusted to the municipal city development plan;
- Building a transportation network adjusted to the new reality.

Why:

- Understand that the complexity of the problem of urban mobility in Luanda, creates conditions for limited impact of structural measures at the transportation network;
- Consider the importance to maintain economic, social and environmental development of Luanda city, in the long term;
- Develop a new point of interest and wealth creation in order to attract people to another city different from Luanda.

Impact on urban mobility: Assuming that the relocation of the capital would lead to a natural reduction of inhabitants in Luanda and simultaneously measures would be taken in the transportation network of Luanda, it would be expected:

- A reduction in the number of vehicles in circulation and consequently the level of road accidents;
- A reduction in the volume of CO2 emissions thrown to the atmosphere;
- Significant improvement of the investment environment in Luanda.

Implementation conditions: Projections made by experts[31] in Management and Urban Regeneration point to a time horizon of 10 to 20 years to build a new city, and about 100 years for it to become attractive and sustainable. On the other hand, international case studies, such as the case of Brazil where the capital was relocated from Rio de Janeiro to Brasília, indicate that it involves such a high investment that costs were never really recorded. Finally, the existence of political risk, taking into account the case of Brazil, where the city management of l Rio de Janeiro became vulnerable and subject to unclear relationships with networks of drug trafficking and narcotics, losing some control over the city.

Conclusion: The existence of several similar cases of success internationally such as Brazil do not exhibit the same degree of applicability in Angola, given the specific nature and complexity of the problem of mobility in Luanda as well as for its lack of consistency with the recent steps taken by the regional administration.

5.2 Urban development by clusters

Hypothesis: Growth of the city in the opposite direction of downtown through urban clusters.

[31] Magalhães, 2009

How:

- Creating a partnership with IPGUL[32] (Institute of Planning and Urban Management of Luanda) to acquire know-how on the best way to implement a plan for sustainable urban development;
- Arranging the city through cells with internal radius of 1km and close together, so that the population does not have to move to the centre of Luanda whenever they need to satisfy basic needs (buying food, postal office, finance, etc.).

Why:

- Creating these clusters avoids the frequent movement of individuals from the periphery to the centre, since they have within the same radius everything needed for their everyday life;
- It decongests the centre of Luanda, where there is large concentration of people, companies and services, which make it a red zone for the movement of people in this part of the city;
- Mapping the territory by clusters would also project a more sustainable city in the long term.

Impact on urban mobility:

- Allows to increase life quality of the population living in Luanda, since the movements required are much shorter than what is currently done;
- Better flow of traffic and people in the centre of Luanda;
- Allows Luanda to restructure gradually, based on a qualified urban development and thus preventing the growth of future disorganized settlements.

[32] IPGUL, 2012

Implementation conditions: According to international examples,[33] namely in Paris, the distribution of clusters in the city increased the flexibility of movement of the inhabitants within the city, significantly improving their convenience since within a small territorial space they can get all necessary infrastructure to meet the basic needs of their daily life. After implementation of the project planning cell, there was an increase of 2.5% in the number of inhabitants in Paris between 1999 and 2006,[34] which would be somewhat counterproductive in the specific case of Luanda.

Conclusion: The city and particularly the centre of Luanda had been growing very fast and in a disorganized manner, which creates difficulties for the formation of urban clusters with the necessary conditions for the population to take advantage of this urban development model. Although there is some free territory outside the centre of Luanda for urban growth and development through clusters, the existing level of accessibility makes them unattractive for people to live there. In order to maximize the efficiency of this solution, it is required to invest significantly on the level of accessibility and transportation to the cells furthest from the urban centre of Luanda.

5.3 Continuity plan – Urban Integrated Plan

Hypothesis: Adopt a set of interconnected measures with effects in the short, medium and long term

How:

- Applying a strategic approach to the problem of urban mobility in Luanda, making a structured analysis based on five pillars;[35]
- Considering the vital importance of political will in the decision-making process

[33] ADB Urban Innovations, 2008
[34] INSEE, 2011
[35] Please check forward the correspondent five pillars

- Implementing possible solutions considering the different time horizons (short, medium and long term);
- Considering the categories and areas with the most relevant impact on the daily life of population (environment, economic efficiency, life quality and safety).

Why:

- Avoid implementing measures loosened or disengaged from each other so as to maximize their impact;
- Understand the political and economic context of Luanda moves it into consideration as a critical success factor in the implementation of the measures proposed;
- Understand the importance of making a temporal planning of the solutions and adopt them according to the plan settled before;
- Understand the relevance of these solutions for the daily life of the population.

Impact on urban mobility: Reduction on the number of road traffic offenses and disobedience to law enforcement officers, improvement of public transport population, increased flow of traffic in the centre of the province and reduction of road accident rate.

Implementation conditions: The continuity plan proposed by Greenwich Consulting presents a set of interconnected solutions and implementation steps previously defined which lead to positive enhancement of the cost / benefit ratio and controls the risk of implementation in a specific period of time. This strategic approach will allow authorities to effectively manage the risks inherent to the implementation of the continuity plan.

Conclusion: The continuity plan presents itself as the scenario that has the lowest degree of disruption amongst the remaining alternatives presented previously. Taking into account the demographic and urban characteristics of the population of Luanda, hence one concludes for the need of an action plan with the necessary flexibility to deal with the daily challenges of urban mobility in Luanda.

5.4 Scenario comparison[36]

Key aspects:

- The initiative of relocating the capital presents itself as a scenario with a time and cost too high for the benefit they could bring in the future;
- The urban development by clusters has a reduced degree of efficacy when taking into consideration the complexity of the current existing problem of urban mobility in Luanda;
- The continuity plan presents itself as the most suitable solution to the current reality of Luanda, with significant benefits and a risk-controlled implementation.

Conclusion: After comparative analyses of alternative scenarios presented, it is concluded that the scenario that best serves the population of Luanda is the continuity plan proposed by Greenwich Consulting Angola.

6. MobiLuanda Plan – Greenwich Consulting

The MobiLuanda plan is founded on five pillars, taking into account different time horizons – short, medium and long term – and considering four important categories for the daily life of the population – environment (henceforth shortened to E), economic efficiency (EF), life quality (LQ) and security (S).

[36] See appendix 8.2

6.1 Main pillars

The MobiLuanda plan is founded on five pillars:

1. *Accessibility*: Creating an integrated public transport system and infrastructure support, encouraging the creation of redundancy and watching the galloping population growth.
2. *Civism*: Raising awareness in the population of the importance of adopting behaviours that lead to better coexistence in society.
3. *Prevention*: Understanding the current problems in order to reduce negative externalities of urban mobility, alerting the public to the consequences and risks posed by their behaviours and attitudes.
4. *Intelligence*: Collecting, managing and integrating existing information on the subject of urban mobility in order to increase the efficiency of resources usage for private and public means through the systematization of the main processes.
5. *Investment*: The continuous population growth and the critical condition of existing infrastructure make critical a significant raise in the investment levels.

6.2 Main measures[37]

The following practical measures will be divided in short, medium and long term, and impact categories will be mentioned after each measure. A full illustration of MobiLuanda is available on the appendixes.

[37] See appendix 8.3 for a detailed illustration of MobiLuanda Plan

Short-term: In the short-term the focus of the authorities should go through the implementation of simple, practical and visible impact on the daily lives of the population.

- Report rights and civic duties in public transport (LQ+S)
- Communicate the impact of disobedience to the highway code (LQ+S)
- Launch civic education program in schools, universities and businesses (LQ+S)
- Disclose the schedules of public transport (EF+LQ)
- Map existing networks and disseminate existing routes (LQ)
- Adjust public transport timetables according to periods of increased traffic (LQ)
- Install information boards showing the best route alternative (EF+LQ)
- Creation of social pass (EF+LQ)
- Streamline procurement of public works related to smaller road network (EF)
- Tarring of all roads from downtown Luanda (EF+LQ)
- Increase public lighting (S)
- Draw a plan of frequent collection of solid waste (E)
- Increase the number of police officers in hours and in critical locations (S)
- Place vertical signs at critical locations (LQ+S)
- Engage in mapping of the city - streets, services, etc... (EF+LQ)

Medium-term: In the medium term structural measures should be taken to create conditions for a consistent change in the urban mobility paradigm in Luanda, through the implementation of measures like:

- Create qualified institutions to do the planning of Luanda's public transport (EF)
- Renew and take care of the maintenance of public transportation (E)

- Build multimodal platforms (EF + LQ)
- Build higher “walk protection” as a preventive measure for pedestrians (S)
- Increase the number of air and ground crossings (S)
- Replace the busiest intersections for roundabouts (S)
- Enhance maritime transport through the port of Luanda (EF + LQ)
- Provide incentives to the use of motorcycles (design of special parking spots and exclusive road paths) – (EF)
- Provide training for professional drivers (S)
- Improve the training given to drivers in driving schools (S)
- Build infrastructure for water drainage (E)
- Install preventive system for pedestrian crossing (“Puffin” system) (S)
- Create incentives to companies to move from the centre to the outskirts of Luanda (EF)

Long-term: In the long term it will be important to consolidate the measures implemented along the years by installing management information systems, and adopting a set of measures like:

- Build highways and / or outer circular allowing the flow of traffic in the downtown (EF + LQ)
- Increase the presence of public transport in critical areas (LQ)
- Build car parks (LQ)
- Create exclusive lanes for movement of public transport (LQ)
- Build a new airport outside the city centre (EF)

- Use buses of different sizes in accordance with the level of demand throughout the day (EF)
- Decentralize public services out of Luanda (EF)
- Connect the transport system of Luanda with the other provinces (EF + LQ)
- Create a plan for more frequent maintenance of roads (S)
- Promote the use of renewable energy-powered transport (E)
- Implement centralized management system to deal with traffic (EF)
- Install video surveillance system on the roads (S)
- Install locators in taxis to prevent cases of theft or kidnapping (S)
- Adapt the Municipal Plan for the development of the transport network of the city of Luanda (LQ)
- Give incentives for telecommuting (EF + LQ)

6.3 Main impacts[38]

After the implementation of the continuity plan it will be possible to figure out some impacts on four different areas: environment, economic efficiency, life quality and security.

Environment:[39]

- Reduction by 20% in the volume of CO2 emissions into the atmosphere after the implementation of roundabouts instead of intersections
- Approximate decrease noise pollution by 10%, the direct effect of the decrease in the circulation of private vehicles

[38] Many of these impacts represent estimations projected by Greenwich Consulting experts, that were based on similar projects already done for other African big cities such as Lagos (Nigeria) and Accra (Ghana)

[39] Coelho, M.C., Farias, T.L., Rouphail, N.M., 2005

Economic Efficiency:[40]

- All projects involving improvements to the transport infrastructure (roads and railways) tend to increase average levels of productivity by 20%
- After implementing a system of public transport is expected to approximate 33% reduction in per capita spending on your daily commute
- Positive impact on GDP, whereas the annual cost of congestion can reach 2%[41] of GDP

Life quality:[42]

- It is expected an average decrease of 60% in the average time spent in traffic, as a result of construction traffic routes that allow the flow of traffic downtown
- After the release of offering alternative means of transportation, it is possible to anticipate a 40% reduction in average daily travel time home / work
- Information panels will reduce time resulting in traffic delays by 20%

Security:[43]

- Up to 70% reduction in the number of accidents in intersections after replacement of roundabouts[44]
- After prevention campaigns, it is expected a decline of approximately 15% in the number of road accidents
- Increased number of law enforcement officers on the street by 10% will approximate reduction of crime rate by about 3%[45]

[40] Capgemini, 2007
[41] Greenwich Consulting projections
[42] Forecasts made by Greenwich Consulting experts
[43] Edward J., Myers, P., 2002
[44] Russel, S., 2003

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8. Appendixes

8.1 Problem Evaluation[46]

	Problem	Environment	Economic Efficiency	Life Quality	Security	Total
Under sizing of the city	Limited capacity of international transportation of passengers	○	◔	◑	○	◔
	Congestion of the main arteries of the city in rush hour	◑	◕	●	◕	◕
	No mapping of the city	○	◔	◑	◔	◑
	Lack of parking alternatives	◔	◕	◑	◔	◕
	Concentration of services and jobs in the city center	●	◕	●	◕	●
	Reduced number of railways	◑	◑	◕	◔	◕
	Logistics hub in the city center	●	◑	◕	◕	◕
Rodov. Inf.	Poor water drainage infrastructure	◑	◑	◕	◔	◕
	City in constant reconstruction	●	●	●	◔	●

	Problem	Environment	Economic Efficiency	Life Quality	Security	Total
Road accidents	Disregard for the highway code	○	◔	◑	◕	◑
	Conservation status of the vehicle fleet	◑	◕	◑	◕	◕
	Lack of road signalization	◔	◑	◕	◔	◑
	Natural aggressiveness of people	◑	◑	◑	◕	◕
Pedestrian barriers to mobility	Occupation of footpaths by informal markets	◑	◕	●	◕	◕
	Lack of safe pedestrian paths	◔	◔	◕	●	◕
	Low level of security in the city	○	◕	◕	●	◕
Cost of mobility	Corruption by traffic authorities	○	◕	◔	◕	◑
	Number of public transport	●	◕	◕	◔	◕
	Poor quality of public transport	●	◕	◑	◕	◕
	Dependence on imported vehicles	○	◕	◔	◔	◔

○ Low impact ● High impact

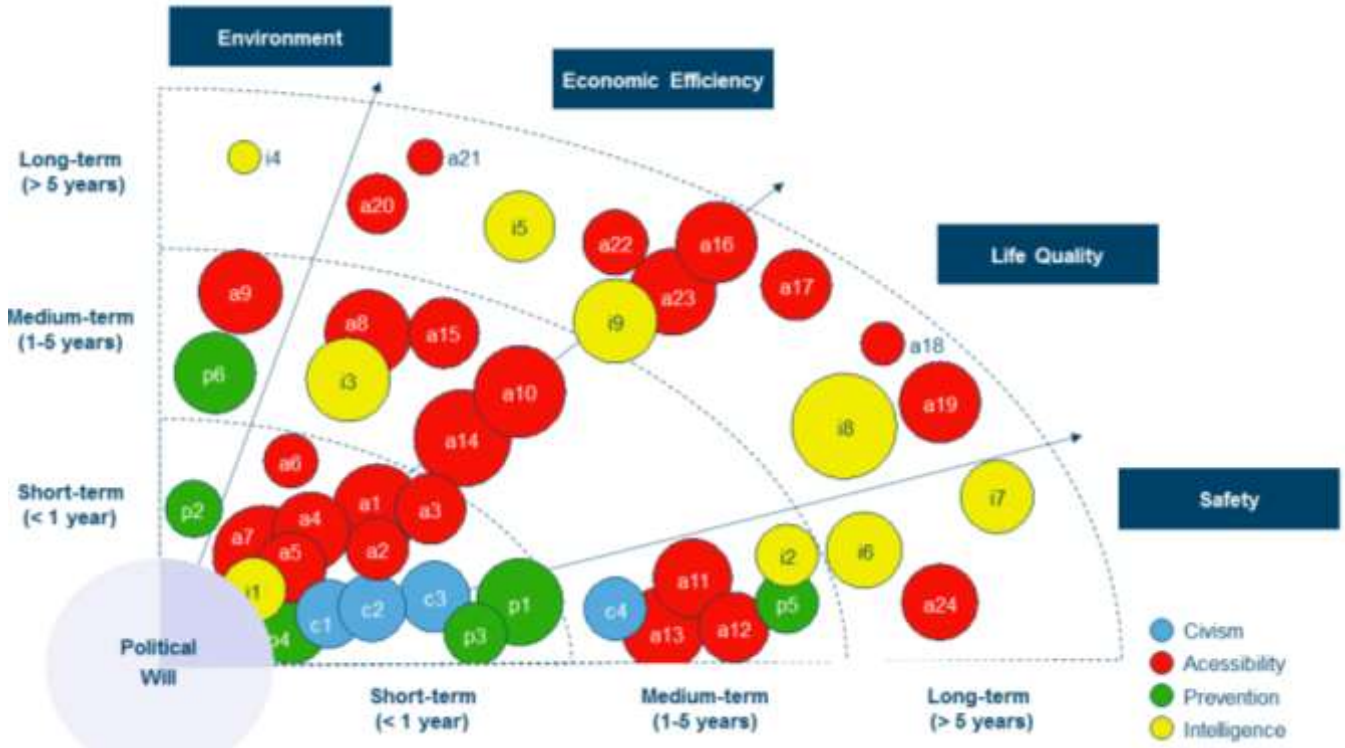
Note: Degree of total impact is assessed through the fill volume of the corresponding circle

[46] Qualitative analysis done by Greenwich Consulting team, considering empirical observations and results from previous projects and personal experiences

8.2 Scenario Comparison[47]

	Lower cost	Higher benefit	Less time	Level of applicability
Capital Delocalization	○	●	○	◔
Urban Development by clusters	◑	◕	◑	◕
Continuity plan	◕	◕	◕	◕

8.3 MobiLuanda Plan Illustration[48]



[47] Qualitative comparison done by Greenwich Consulting team, taking into consideration all the data available during the research

[48] Illustration model created by Greenwich Consulting